



## YOUR GUIDE TO

# ANTERIOR CRUCIATE LIGAMENT SPRAINS

## Contents

|   |          |
|---|----------|
| What is an Anterior Cruciate Ligament Sprain? .....     | 3        |
| What causes an Anterior Cruciate Ligament Sprain? ..... | 4        |
| What treatment can I receive? .....                     | 5        |
| What exercises should I do? .....                       | 7        |
| <b>Exercises</b> .....                                  | <b>8</b> |
| Phase 1 .....   | 8        |
| Phase 2 .....   | 12       |

## Introduction

**Please take note of the following before starting any of the exercises in this guide:**

- The information contained in this guide is intended to assist in managing your recovery.
- This guide is based on the latest medical research in the field and contains the best advice available to the best of our knowledge.
- This guide is complimentary to other medical services and is not intended as a substitute for a health care provider's consultation. Never disregard medical advice or delay in seeking advice because of something you have read in this guide.

● Many people have found quick and lasting relief from their pain by acting upon the information provided, but everyone decides for themselves what to do with this information. Should you doubt a particular exercise in your situation, please consult your health professional.

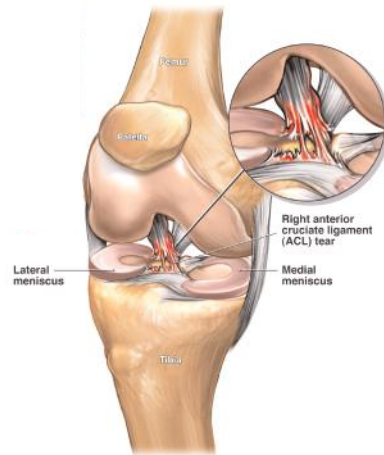
**When consulting your health professional, it is wise to take this guide with you to show them.**

# What is an Anterior Cruciate Ligament (ACL) Sprain?

A sprain is a joint injury that causes a stretch or tear in a ligament. Ligaments are strong bands of tissue that connect one bone to another and provide stability to the joint. The anterior cruciate ligament (ACL) is one of the four major ligaments in the knee and along with the posterior cruciate ligament (PCL) is found inside the knee joint. It is a broad band that connects the thigh bone (femur) to the shin bone (tibia). This ligament along with the Posterior Cruciate ligament helps keep the knee stable and protects the femur from sliding or turning on the tibia. It essentially has four main functions

1. Prevents forward movement of the femur on the tibia
2. Prevents the knee from over extending (straightening)
3. Acts as a secondary stabilizer to forces applied to the outer side of the leg, which force the knee inwards. This reinforces the work of the medial collateral ligament, which attaches on the inner (medial) side of the knee between the femur (thigh bone) and tibia (shin bone)
4. Controls rotation of the tibia on the femur in straightening of the knee in the end of its range

**Sprains are graded I, II, or III depending on their severity**



**The knee joint showing a ruptured anterior cruciate ligament.**

## GRADE I SPRAIN

The fibers of the ACL ligament are stretched, but there is no tear in the fibers. There is a little tenderness and swelling around the joint, but weight bearing and walking are still possible. The knee does not feel unstable or give way during activity.

## GRADE II SPRAIN

The fibers of the ACL ligament are partially torn and there is tenderness and moderate swelling around the joint. Walking feels uncomfortable, and you may need to limp. The joint will feel unstable or give way during activity. It is recommended that you consult your doctor or physiotherapist for a full evaluation.

## GRADE III SPRAIN

The fibres of the ACL ligament are completely torn (ruptured) and there is usually a lot of pain at the time of rupture which may decrease as time goes on. There may be a little swelling or a lot of swelling. The ligament can no longer give the knee the support

that it requires and therefore the knee will feel unstable and may give way. Because of pain and instability, walking is usually not possible and the use of crutches is recommended. This type of injury requires a visit to the doctor or physiotherapist and can require surgical intervention.

# What causes an ACL sprain?

The anterior cruciate ligament (ACL) is frequently injured in forced twisting motions of the knee, especially if the foot is firmly planted on the ground. This can occur by either a direct force (e.g. motor vehicle accident, tackle in sport etc.) or indirect force (e.g. side-stepping, pivoting or landing from a jump). It may also become injured when the knee is straightened further than it normally can straighten (hyper-extended) or when the thigh bone is forcefully pushed across the shin bone, such as with a sudden stop while you are running or a sudden transfer of weight while you are skiing. If the ACL is injured through impact then it is very likely the other knee structures such as the medial collateral ligament and the menisci may also be injured, and it is therefore important that these structures are also assessed.

## SYMPTOMS

There is usually a loud, painful pop when the joint is first injured. This is often followed by a lot of swelling of the knee within the first several hours after the injury. After pain and swelling resolve you may have episodes of instability and feel that the knee is giving way. If you have torn your anterior cruciate ligament in an injury that occurred months or years ago and you haven't had reconstructive surgery, you may continue to have the feeling that the knee is giving way during twisting or pivoting movements. If this is the case it is important that you consult with a physiotherapist who will be able to go through a rehabilitation programme with you to try and strengthen the muscles around the joint and limit this from happening.

# What treatment can I receive?

Treatment depends on the severity of the injury and whether there are any other associated injuries, such as medial collateral ligament tear or a meniscal tear.

## ICE

This is an important aid in relieving pain and decreasing swelling by reducing the bleeding in the damaged tissue. It should be applied to the injured knee for 10-15 minutes every two hours (never apply ice directly to the skin) and is an essential part of the treatment, especially in the first 48hrs after the injury.

## PRECAUTIONS WHEN USING ICE THERAPY.

- **Ice treatment must be used carefully otherwise it may cause a skin burn.**
- **Never put an ice pack directly onto the skin, always use a damp towel or cloth to prevent an ice burn.**
- **Only apply an ice pack to areas of skin with normal sensation i.e. you must be able to feel hot and cold.**
- **Never put an ice pack over an open wound or graze.**
- **Do not apply an ice pack to an area with poor circulation.**
- **Never leave an ice pack on the skin longer than the time stated in this advice sheet.**

- **Adults should always supervise young children when using ice packs. Application may be reduced and extra care should be taken when checking the skin.**

- **Remember to check the skin underneath every 5 minutes for:**

- Whiteness of the skin
- Blueness of the skin
- Blotchy and painful skin
- Excessive numbness

**If you get any of these symptoms remove the ice pack immediately.**

## BRACE

A knee support can be used to provide additional stability to the knee. A brace will also provide compression of the joint that will aid in reducing the swelling around the joint. Compression of the joint, as with ice, helps to speed up the inflammatory process after injury. It is however important that you do not rely on a knee support indefinitely. By wearing a brace for too long, without an associated rehabilitation programme, your muscles will weaken as they will not be needed as much. If unsure always seek professional advice and use a support as part of an overall rehabilitation programme.

## PHYSIOTHERAPY AND EXERCISE REHABILITATION

It is imperative to get the movement in your knee back as quickly as possible, to prevent a permanent reduction in motion. For complete tears, you and your health care provider will decide if you should have intense rehabilitation or if you should have surgery followed by rehabilitation. Even if ACL reconstruction is planned, it is important to regain as much range of movement and strength in the leg before surgery, as this will aid in your post surgery rehabilitation and return to full function. If surgery is not necessary then your health care provider will still prescribe a rehabilitation programme which will include a range of stretching, strengthening, and proprioception exercises that will aid you in your return to full function. Exercises are essential for maintaining range of motion and strengthening the muscles that compensate for the absence/or increased laxity of the ligaments that provide stability to the joint.

## SURGERY

An ACL reconstruction is dependant on a number of factors including; the patient's age and activity level, associated injuries (e.g. a meniscal tear, medial collateral ligament injury or significant cartilage damage), a patient's response to rehabilitation, the amount of instability in the knee, and magnitude of the symptoms. It is important that you discuss the pros and cons of ACL reconstructive surgery with your surgeon, and are fully aware of the post op rehabilitation process before making a decision.

## SUPPLEMENTS

**To aid joint healing:**

- **Glucosamine Sulphate** is found largely in cartilage and plays an important role in its health. It is thought that supplementing with Glucosamine may help in the healing of joint injuries and arthritis
- **Chondroitin Sulphate** allows other molecules (nutrients) to move through cartilage. This is especially important as the blood supply to cartilage is particularly poor. If nutrients cannot get to the damaged area then healing is unlikely to take place.

# What exercises should I do?

This pack includes an exercise programme that can be done after an ACL injury. It is however important that you are aware that the exercise programme included is a general exercise programme for an Anterior Cruciate ligament strain, which can be adjusted depending on advice that you have been given by your health care professional on assessment. The goal of rehabilitation is to return you to your sport or activity as soon as is safely possible. If you return too soon, you may worsen your injury which will delay your recovery and may result in permanent damage. Everyone recovers from an injury at a different rate, and return to activity will be determined by how well your knee recovers. If your knee is feeling at all unstable and/or you are unable to weight bear on it, it is essential that you consult your doctor or local physiotherapist before starting any exercise programme, as these symptoms indicate a grade II or III sprain and require further attention. If you have had ligament reconstruction, it is also essential to consult with a physiotherapist who will take you through an extensive rehabilitation programme that will be designed to ACL reconstruction, and will be specific to your needs. After reconstruction it is your surgeon who will determine when it is safe to return to your sport or activity.

## INSTRUCTIONS

- Keep all exercises in your pain free limits. **Trying to work in painful ranges will only prolong your recovery.**
- If you experience pain during any of the exercises, decrease the intensity of the exercises by:
  - decreasing the number of sets
  - decreasing the number of repetitions
  - decreasing the range of movement
  - decreasing the resistance
- Do all exercises slowly and breathe normally.
- Progress gradually according to your own level of comfort.
- Following exercise, stiffness or fatigue may result but should not last longer than 24 hrs. The symptoms of your injury should not be aggravated.

# Exercises phase 1

**Only start with these exercises if you have a grade I ACL sprain, and are therefore not experiencing any giving way or instability of your knee.**

Always work in a pain free range of movement when doing an exercise programme and make sure that you

consult with your physiotherapist if you are experiencing pain with any of these exercises and have already decreased your range of movement, or if you start to experience instability. Perform all exercises in a slow and controlled manner.

## STRETCHING EXERCISES

● Repeat each of these stretches 3 times (on both sides if necessary).

● Hold a steady stretch, do not bounce.

● Hold each stretch for at least 30 seconds.



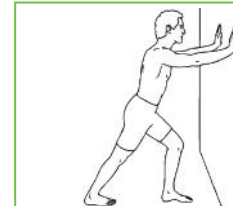
### QUADRICEPS

Lying on your right side, your right arm extended up to cushion your head, use your left hand to grasp your left ankle as you bend your left knee backwards. You should feel the stretch along the front of your thigh. It is important to keep the other leg bent at both the hip and the knee, so as not to hyperextend your back. A towel can be used to aid you if you are unable to bend your knee too far'



### HAMSTRING

Lying on back with one leg straight, raise the bent knee towards you and hold behind your knee. Now slowly straighten your knee until a stretch is felt in the back of the thigh. A towel can be put around your leg to aid you in the stretch



### CALF

Keeping back leg straight, with heel on floor and both feet facing straight forwards, lean into wall until a stretch is felt in the lower leg

## Exercises phase 1 (continued)

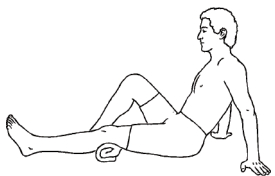


### BUTTOCKS STRETCH

Lying on your back, rest your right ankle on your left knee. Using your hands lift your left leg into the air, bending the knee at 90°. Pull your left leg gently towards your body. You should feel a stretch in the upper back part of your right leg and buttock. A towel can be used to aid you in this stretch if you are unable to reach your leg.

## STRENGTH EXERCISES

- Repeat 2 sets of 10-15 repetitions on each side (unless otherwise stated in the exercise)
- Perform each exercise in a controlled manner and within a pain free range of movement



### TERMINAL LEG EXTENSIONS

Sitting on the floor with one leg outstretched in front of you and a pillow/rolled up towel under the knee. Try and lift the heel off the floor by contracting your thigh muscles and straightening the leg, hold for 10 sec and then relax. You should feel the muscle on the inside of your leg contracting. Your main focus should be on contracting your thigh muscle and not on lifting your heel off the floor. As you get stronger the two will go hand in hand.



### BALL SQUEEZING AND PUSHING (a pillow can be used)

Lying on your back with your knees bent, firstly place the ball between your knees and squeeze. Hold for 10 seconds and repeat 10 times. Now place the ball between your knee and the wall, push out for 10 seconds and repeat 10 times on each leg



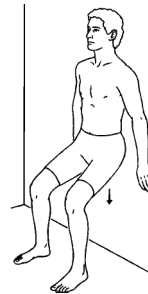
### BRIDGING

With your pelvis in neutral (hip bones facing towards the ceiling) and TA contracted (pull belly button to spine), slowly raise buttocks from floor, keeping your pelvis stable and body in a straight line. Hold for 10 seconds and repeat 10 times.



### STEP-UPS

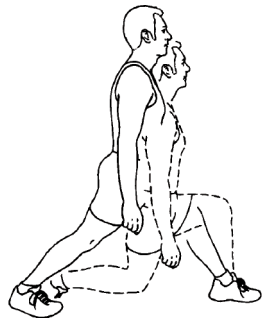
Stand with one leg on a step facing up the stairs. Slowly lower yourself by bending your knee. Return to starting position without pushing off with the opposite leg. Be aware that your knee and foot do not roll inwards, that your weight is mostly on your heel with your foot flat, and that your knee goes down in line with your second toe.



### WALL SLIDES

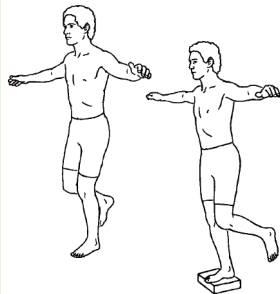
Stand leaning up against a wall, your feet a little away from the wall with your toes pointing forwards. Push your back against the wall. Slowly lower your body into a seated position and hold this position for 10 seconds. Complete 10 repetitions. Make sure that you work in a pain free range of movement, that you don't go down further than 90° in your knees, and that your feet are far enough forwards that your knees do not go over your toes.

## Exercises phase 1 (continued)



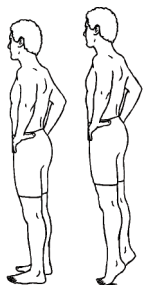
### STATIC LUNGES

Place one foot in front of the other. Bend both knees together until you have a 90° bend in both. Ensure that your front knee does not go over your front foot when bending to 90°. Return to the starting position. Perform 1 set of 10 reps per leg (complete all 10 reps with the one foot forward before changing and starting with the other leg in front). Progress this exercise to stepping lunges (i.e. start with feet together and step into a lunge position) once you are pain free with the above. Again when you lunge down, make sure that both knees are at a 90° angle and then return to the starting position



### STORK STANDING

- Balance on one leg for 30 seconds and repeat with the other leg.
- Repeat the above with your eyes closed. Progress the above to standing on an unsteady surface, e.g. a cushion or a narrow piece of wood.



### CALF RAISES

Supporting yourself against a wall, raise up onto your toes in the following manner: First onto your big toe, then onto the middle of your foot and then onto your little toe. Repeat this sequence 10 times.

## Exercises phase 2

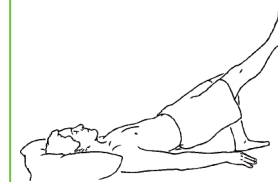
Phase 2 exercises can be started when you are able to do all the Stretching and Strengthening exercises in Phase 1 with no adverse effects and good

control. Continue to work in a pain free range of motion, and continue to do the stretching exercises of phase 1 with each exercise session.

### STRENGTH EXERCISES

- Repeat 2 sets of 10-15 reps on each side (unless otherwise stated in the exercise)

- Maintain good control and form throughout the exercise i.e. in both directions of movement



### BRIDGING WITH ONE LEG EXTENDED

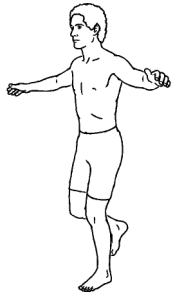
Lying on your back, bend both knees to 90° with your feet flat on the floor. Tighten T.A. (pull belly button to your spine) and lift your pelvis and lower back off the floor. Now lift one foot off the floor, hold for 10 sec, put it back down, repeat with the other foot, and then relax completely. Begin again. Keep the T.A. and Glutes tight throughout the movement to keep the pelvis stable and without dropping to the one side. Repeat 5 times per leg.



### STEP-DOWNS:

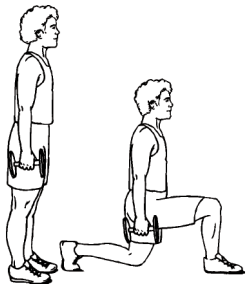
Stand on one leg on a step facing down the stairs. Slowly lower yourself by bending your knee. Return to starting position without pushing off with the opposite leg. Be aware that your knee and foot do not roll inwards, that your weight is mostly on your heel with your foot flat, and that your knee goes down in line with your second toe.

## Exercises phase 2 (continued)



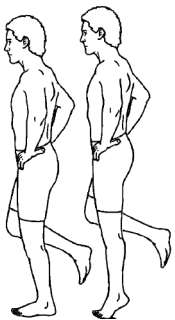
### STORK STAND PICK-UP

Standing on one leg, with your weight on your heel, bend down to pick up a weight with the opposite hand ensuring that your weight stays on your heel, and that your knee goes down in line with your second toe. Also ensure that your knee and not your back does the bending work. Up and down is one repetition. You can start by placing the weight on a chair and gradually progress to picking it up off the floor.



### LUNGES

Lunge with one foot forward keeping the knees 90° (or at least attempt to reach 90°). Ensure that your front knee does not go over your front foot when bending to 90°. Return to the starting position. Now lunge to the left side in the above technique and then to the right (i.e. change the direction of movement). Try to be as stable as possible during the exercise, and perform it as a complete movement. A set of ten in each direction is counted as one set. Start with this and progress to two if you are able.



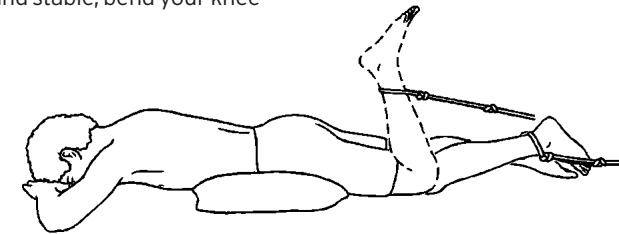
### SINGLE LEG CALF RAISES

Standing on one leg, supporting yourself against a wall, raise up onto your toes in the following manner: First onto your big toe, then onto the middle of your foot and then onto your little toe. Repeat this sequence 10 times per leg

### HAMSTRING CURLS WITH BAND

Lying on your stomach with one end of the band tied around your ankle other end tied to the top of a table leg. Start with your knee straight and, whilst keeping your hips on the floor and stable, bend your knee

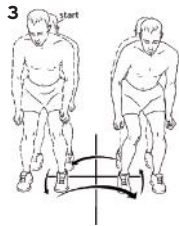
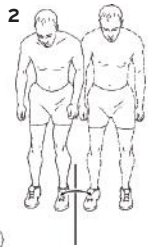
pulling against the band. Attempt to bring your foot down towards your buttocks without allowing your knee or hips to lift off the floor. Repeat 10 times per leg (you can get theraband from a local sport store or physiotherapy practice).



### MINI SQUATS

Stand with your feet hip width apart and hold your hands out in front of you. Now bend the knees keeping your feet flat on the floor, and ensure that your knees do not go past a 90° angle. Return to the starting position. Make sure that both movements are slow and controlled and that your knee goes down straight (no rolling inwards).

## Exercises phase 2 (continued)



### HOPPING SEQUENCE

Hop from one point to another in the following sequences

1. Forward and backward
2. Side to side
3. Jump in a square
4. Jump diagonally forwards and backwards across a central imaginary line

Start by hopping with both legs and as you feel strong enough, progress to one legged hopping. Repeat the sequence 10 times on each foot. These exercises are important to improve functional proprioception (awareness of the body in space), and are essential for effective return to sport. You can also include shuttle running exercises, including zig-zag running, forward backward running, fast and slow interval running etc.

## Contact us

This guide is designed to assist you in the self-management of your injury/condition.

We are here to assist your recovery in the shortest but safest possible

time. If you have any uncertainties or queries regarding the information, please do not hesitate to contact us on:

Phone 017890400999 / 07870166861  
[www.mdphysiotherapy.co.uk](http://www.mdphysiotherapy.co.uk)